

ANDROS 4610 INSTALLATION : NM4

INSTALLATION PROCEDURE

NOTE: Use proper ESD control during all removal and replacement procedures.

1. Turn the System Power switch on the front panel to STANDBY and remove AC power from the machine.

CAUTION: Do not plug or unplug remote display with power applied.

2. Disconnect the following items from the patient interface panel on the left side of the monitor box:

- Remote Display cable
- BP Cuff and BP Gauge lines
- Pulse Oximeter Sensor cable

3. Remove the disposable reservoir (water trap) from its holder.

4. Remove the six screws holding the monitor box cover, and carefully lift the cover from the monitor box.

5. Disconnect the following cables from the upper circuit board on the Multispec assembly (see Figure 1):

- Pwr. Supply Wire Harness from J3
- Data Cable from J4
- Agent Ind. Lights Cable from J1

6. Disconnect the second power supply wire harness from J2 on the lower circuit board.

7. Disconnect the gas sample line from the top port on the fresh gas solenoid. See Figure 1.

8. Disconnect the exhaust hose from the adjustable flow restrictor. (Sample flow adj.) (This is the hose from the exhaust port on the sensor interface panel.)

9. Loosen the four captive mounting screws and lift the multispec analyzer assembly from the monitor box.

10. Position the MSPEC 4610 assembly in the monitor box and tighten the captive mounting screws.

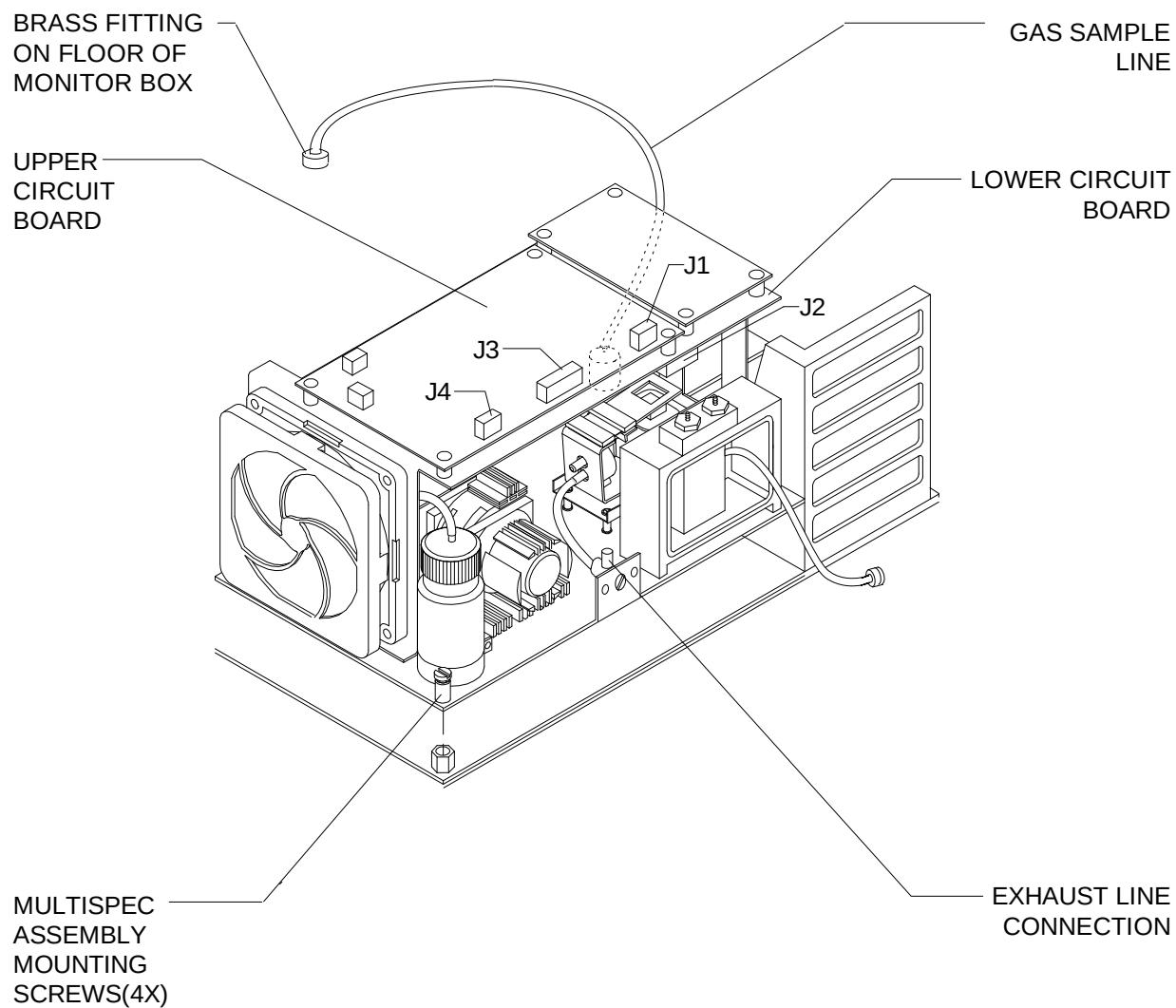
11. Connect the gas sample line to the top port on the fresh gas solenoid. See Figure 2.

12. Connect the following cables to the HC11 circuit board on the MSPEC 4610 assembly:

- Pwr. Supply Wire Harness to J3
- Data Cable to J4
- Agent Ind. Lights Cable to J1

13. Route the unused power supply wire harness (which was formerly connected to J2 on the lower circuit board of the old assembly) along the top of the processor card cage and secure it within the card cage wiring clamps.

INSTALLATION PROCEDURE (continued)



SP11701

Figure 1: MSPEC 4600 GAS ANALYZER

INSTALLATION PROCEDURE (continued)

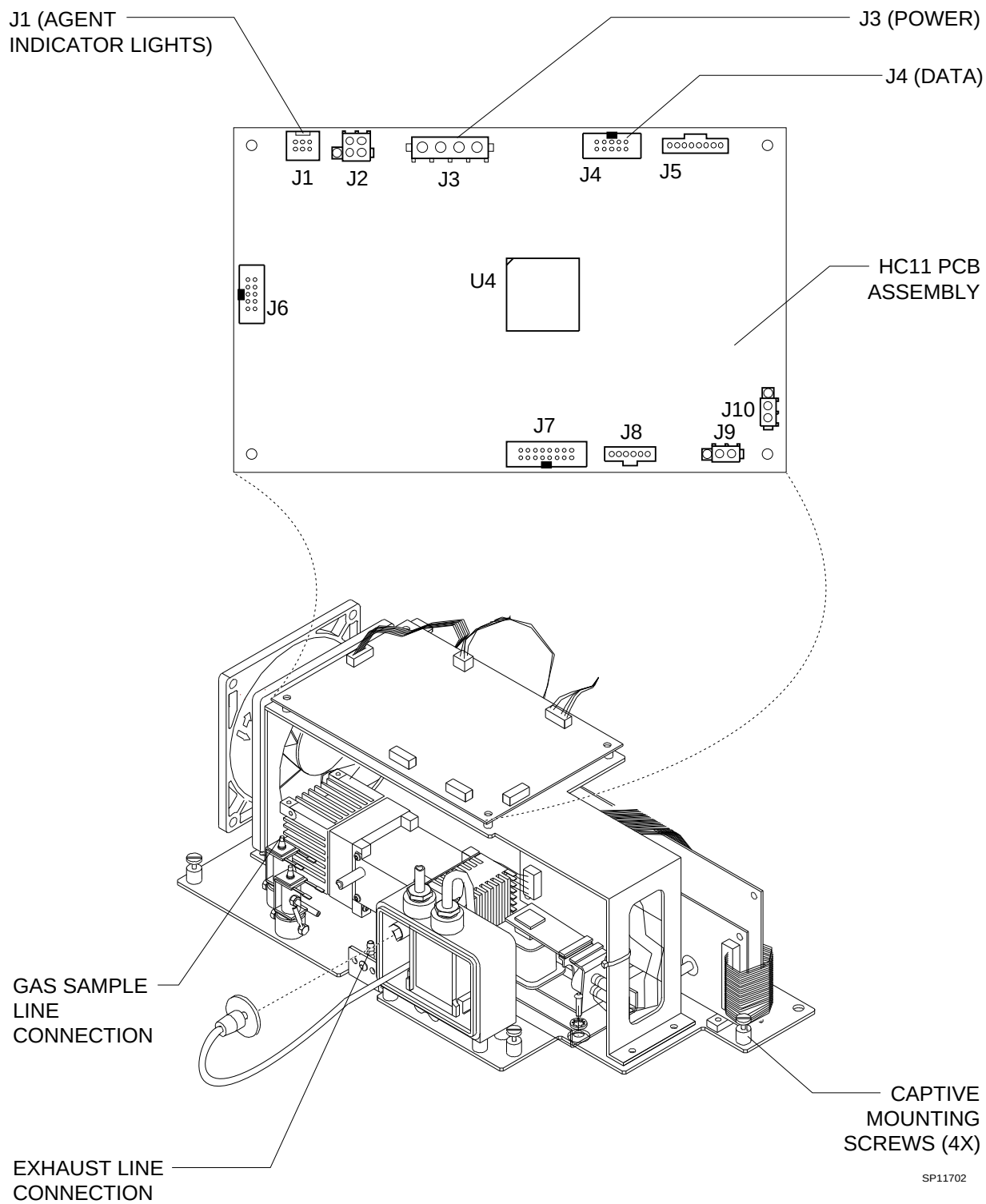


Figure 2: MSPEC 4610 GAS ANALYZER

INSTALLATION PROCEDURE (continued)

14. Connect the exhaust line to the adjustable restrictor on the MSPEC 4610 assembly. See Figure 2.

15. Remove the three vapor indicator labels from the vapor box front cover. Replace the labels with the three arrow vaporizer labels (P/N 4112055) supplied.

16. Install the disposable reservoir (water trap) in its holder.

17. Figure 3 shows early and late model backplane circuit board assemblies. Locate J19 on the backplane circuit board and install a jumper at the appropriate location as noted in the Table 1.

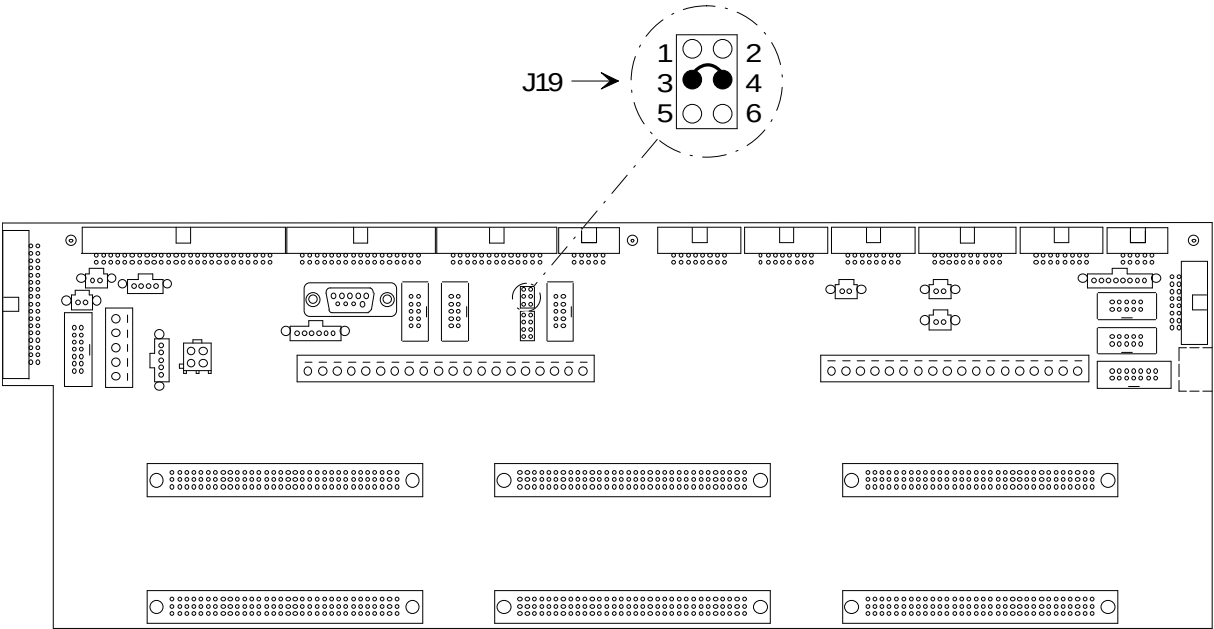
- NOTE:** Use a two position shunt connector (P/N 4109150) for the jumper on later model backplane assemblies. (Depending upon machine configuration, there may be other shunt connectors at locations 1-2 and 5-6.)
18. Restore power to the machine and verify operation of the Waveform Mode in less than 3 minutes, and Data Mode in less than 10 minutes.

 19. Proceed to the ADJUSTMENT AND TEST section.

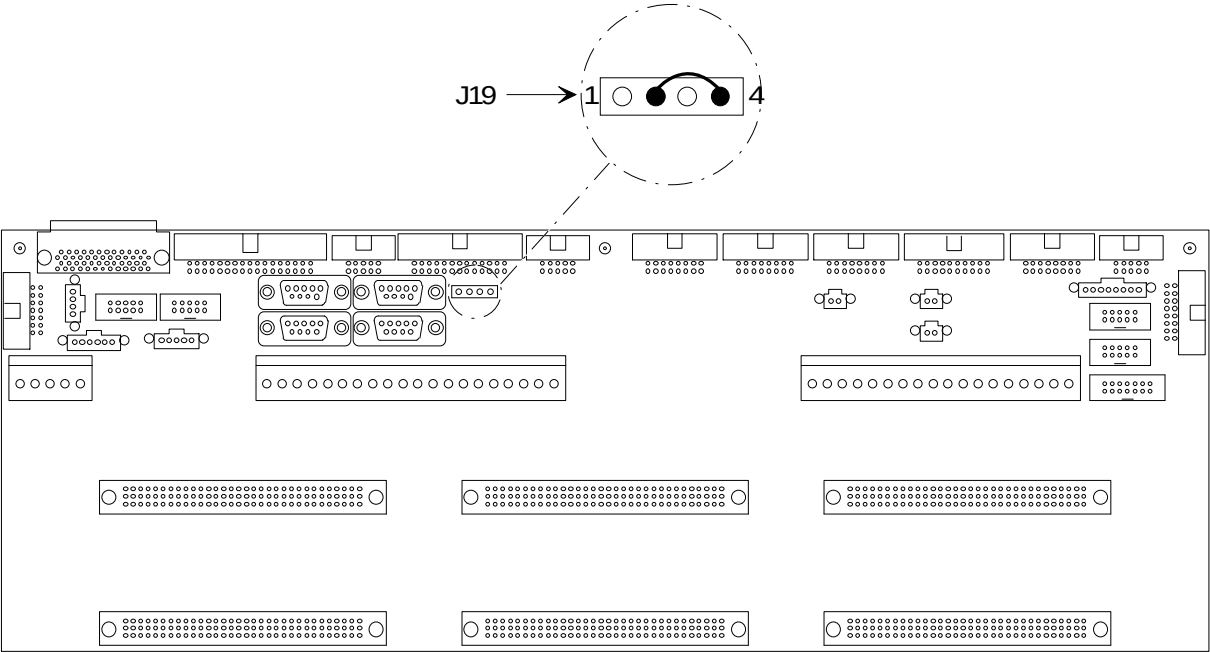
Table 1: BACKPLANE JUMPER LOCATIONS

	Backplane Assembly P/N	Jumper Location on J19
Early Models	4110699	J19-2 to J19-4
Late Models	4111881	J19-3 to J19-4

INSTALLATION PROCEDURE (continued)



NARKOMED 4 BACKPLANE CIRCUIT BOARD ASSEMBLY (LATE MODELS)



NARKOMED 4 BACKPLANE CIRCUIT BOARD ASSEMBLY (EARLY MODELS)

SP11703

Figure 3: BACKPLANE JUMPER LOCATIONS

ADJUSTMENT AND TEST

Sample Flow Rate Adjustment:

20. Connect a flowmeter test stand (P/N S000081) to the exhaust port on the sensor interface panel.
21. After a 15 minute warm-up, set the adjustable restrictor for a flow rate of 225 ml/min.

Line Block Calibration:

22. Connect a patient sample line to the disposable reservoir and ensure that the line is unoccluded.
23. Connect a variable flow restrictor (P/N 4107995) to the patient sample line.

24. Enter the main service screen by simultaneously pressing the MONITOR key, SYSTEM CONFIG key, and the Selection DIAL.
25. Touch the Service Code key on the screen and select SRVC, then enter the TSD I.D. number.
26. Touch the MONITORS key on the screen to bring up the second column of touch keys. See Figure 4.
27. Touch the LINE BLOCK CALIBRATION key on the screen.
28. Wait for the current sample pressure to stabilize, then adjust the restrictor on the patient sample line to obtain a flowmeter reading of 100 ml/min.

CURRENT SAMPLE PRESSURE: 200		OXYGEN	MAIN
LINE BLOCK CALIBRATION PROCEDURE: - WITH PATIENT CIRCUIT ENABLED: - ENSURE THAT SAMPLE LINE IS CONNECTED AND UNOCCLUDED. - PLACE A FLOWMETER AT THE SAMPLE EXHAUST. - ATTACH FLOW RESTRICTOR, FIX 0336, TO PATIENT SAMPLE LINE. - WAIT FOR VALID CURRENT SAMPLE PRESSURE - ADJUST RESTRICTION IN ORDER TO OBTAIN A FLOW OF 100 ML/MIN. - TOUCH "STORE REFERENCE" KEY. - FULLY OCCLUDE SAMPLE LINE AND OBSERVE THAT LINE BLOCK ALARM BECOMES ACTIVE AFTER AT LEAST 15 SECONDS. - REMOVE FLOW RESTRICTOR FROM SAMPLE LINE.		PRESSURE	SERVICE LOG
		RESPIRATORY FLOW	
		SpO ₂	
		NIBP	
			PMS CRITERIA
		GAS ANALYZER	MONITORS
STORED REFERENCE : 200	STORE REFERENCE	LINE BLOCK CALIBRATION	PERIPHERALS

Figure 4: MULTISPEC LINE BLOCK CALIBRATION SCREEN

ADJUSTMENT AND TEST (continued)

29. Touch the STORE REFERENCE key.
30. Fully occlude the patient sample line and observe that the line block alarm becomes active after at least 15 seconds.
31. Turn the System Power switch to STANDBY, then return it to the ON position to retain the new value.

Accuracy Test:

NOTE: Do not use the calibration gas cylinder, NAD Part No. 4110599, to perform the accuracy test.

32. Press the MONITOR SETUP key. Touch the CO₂ CAL key on the left monitor display.
33. Touch the SELECT key on the right display, and configure the display to indicate HAL.
34. Press the DATA key. Touch the GAS ANALYSYS key if it is not illuminated.
35. Attach the CO₂ calibration adapter assembly (P/N 4110216) to CO₂ calibration cylinder (P/N 4107979).
36. Connect the output of the calibration gas adapter to the patient sample line.
37. Open flow control valve on the calibration adapter slightly.
38. After the CO₂ waveform peaks on the remote display, turn off the flow and remove the sample line from the calibration adapter.

39. Verify that the EXP CO₂ display indicates within 36.0 to 40.0 mm Hg.
40. Verify that the EXP Halothane on the agent display indicates within 0 to 0.4%.
41. Verify that the EXP N₂O indicates within 32.0 to 38.0%.
42. If the accuracy test produces readings that have greater than or less than the permissible error range, proceed to Step 43 and perform a span calibration.

NOTE: Values may vary according to different areas of elevation.

If the readings are within specifications, a span calibration is not necessary. Remove the adapter from the CO₂ calibration cylinder and perform a complete PMS on the machine.

Span Calibration:

43. Mount the calibration gas adapter (P/N 4110716) on the calibration gas cylinder, (P/N 4110599) as shown in Figure 5.
44. Enter the service screen (ref. Steps 24 thru 26), and touch the GAS ANALYZER key on the screen. See Figure 6.
45. Wait for a Mode message of "READY".
46. Touch the START key. A Status message of "ZERO IN PROGRESS" will be displayed.
47. Wait for a Status message of "ZERO COMPLETE".

ADJUSTMENT AND TEST (continued)

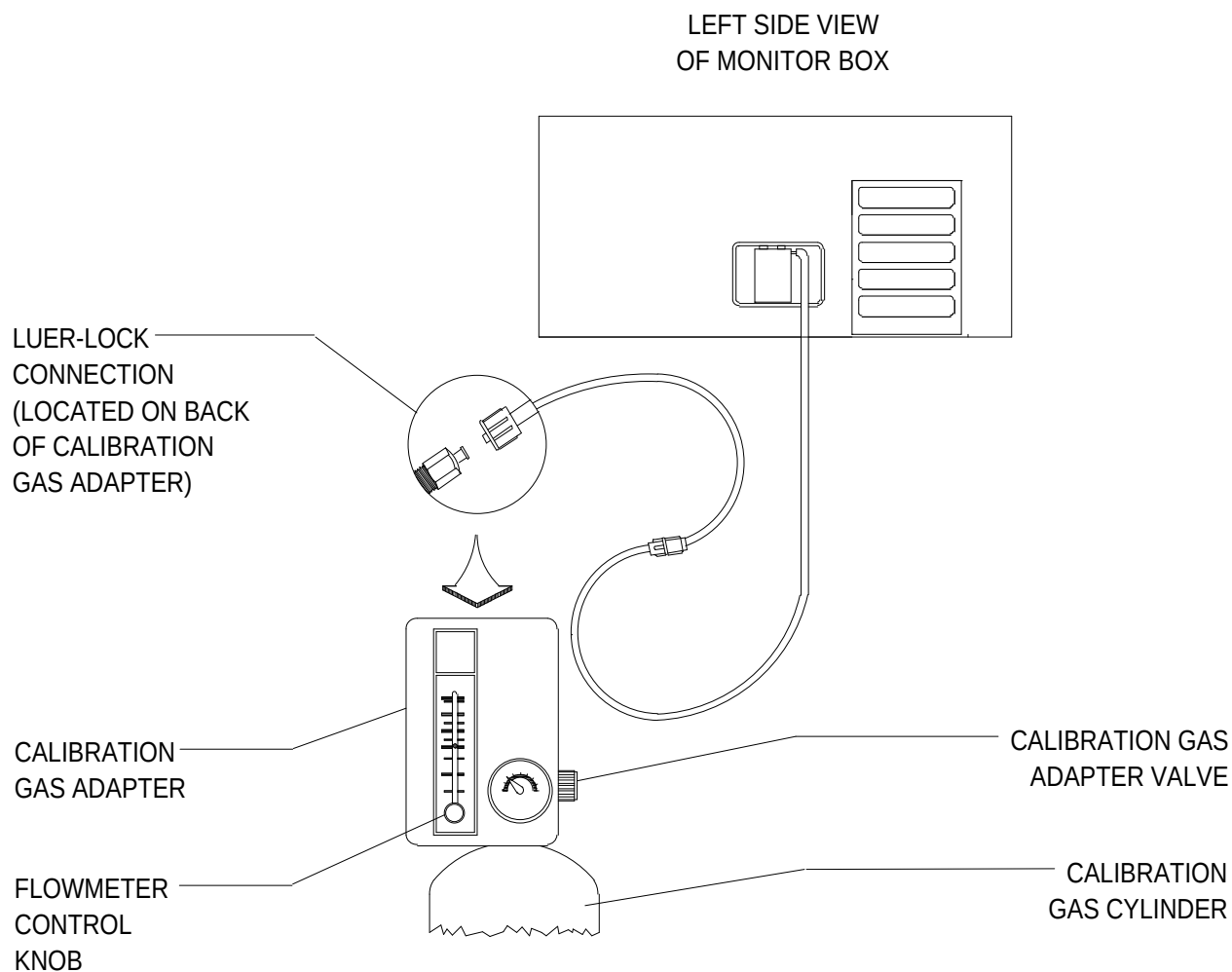


Figure 5: MULTISPEC CALIBRATION CONNECTIONS

ADJUSTMENT AND TEST (continued)

NOTE:

The MODE window on the gas analyzer screen displays the following messages:

INHIBIT during warm-up

READY after 30 minute warm-up

The STATUS window on the gas analyzer screen displays the following messages during calibration:

ZERO IN PROGRESS

ZERO COMPLETE

SPAN IN PROGRESS

After calibration, PASSED or FAILED is displayed.

CURRENT CO ₂ : *INV* CURRENT N ₂ O : 10 CURRENT AGENT : *INV*	MODE: STATUS:	OXYGEN	MAIN
SCRUBBER INSPECTION/REPLACEMENT: - REPLACE SCRUBBER BOTTLE ANNUALLY.		PRESSURE	SERVICE LOG
SPAN CALIBRATION PROCEDURE: - WAIT FOR MODE = "READY". - PERFORM GAS ANALYZER ACCURACY TEST. - IF TEST FAILS, PERFORM SPAN CAL: - WITH PATIENT CIRCUIT ENABLED: - TOUCH "START" KEY, - WAIT FOR STATUS = "ZERO COMPLETE" - ATTACH SAMPLE LINE TO CALIBRATION BOTTLE. - TURN FLOW ON BOTTLE TO 250 ML/MIN - TOUCH "CONTINUE" KEY. - WAIT FOR STATUS = "PASSED" OR "FAILED"		RESPIRATORY FLOW	PMS CRITERIA
		SpO ₂	
		NIBP	
		GAS ANALYZER	MONITORS
CONTINUE	START	LINE BLOCK CALIBRATION	PERIPHERALS

Figure 6: MULTISPEC SPAN CALIBRATION SCREEN

ADJUSTMENT AND TEST (continued)
--

Table 2: MULTISPEC ACCURACY AND NOISE SPECIFICATIONS

Gas Measurement	Accuracy (full accuracy mode)	Noise
Carbon Dioxide	± 2.0 mm Hg (0 to 40 mm Hg) ± 2.5 mm Hg (41 to 60 mm Hg) ± 4.0 mm Hg (61 to 80 mm Hg)	0.5 mm Hg 2.0 mm Hg 3.0 mm Hg
Nitrous Oxide	± 7.5 vol % N ₂ O	3 vol % N ₂ O
Halothane	± 0.2 vol % Hal, or 10% of reading*	0.2 vol % Hal
Enflurane	± 0.2 vol % Enf, or 10% of reading*	0.1 vol % Enf
Isoflurane	± 0.2 vol % Iso, or 10% of reading*	0.1 vol % Iso

* Whichever is greater

48. Connect the output of the calibration gas adapter to the sample line on the disposable reservoir on the left side of the monitor box. Make sure that the Luer-lock connections are tight.
49. Set the calibration gas flow to 250 ml/min.
50. Touch the CONTINUE key. A Status message "SPAN IN PROGRESS" will be displayed during the calibration procedure.

When the span calibration is complete, the message "PASSED" will be displayed on the screen.

If a "FAILED" message appears, the multispec analyzer must be replaced.

51. Turn the System Power switch to STANDBY, then return it to the ON position to retain the new value.
52. Turn off the gas flow at the calibration gas adapter. Disconnect the sample line from the calibration gas adapter and remove the adapter from the calibration gas cylinder. Perform a complete PMS on the machine.



NORTH
AMERICAN
DRÄGER

Quality Service for Life®

Technical Service Department
3122 Commerce Drive
Telford, PA 18969
(215) 721-5402
(800) 543-5047
(215) 723-5935 Fax

Part Number: SP00117
Rev: A
Date: April 20, 1994
© 1994 N.A.D., Inc.